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ENERGY USE OF APPLIANCES

TEXAS AGRICULTURAL EXTENSION SERVICE

The Texas A&M University System

Dear Energy Saver:

Saving appliance energy plays an important role in saving home energy and reducing consumer demand for energy resources. Heating and cooling appliances are the major household energy users, followed by water heaters and other appliances.

This letter is the first in a new series of six provided by the Texas Agricultural Extension Service to assist you in reducing energy consumption in your home. If you need more information on topics covered in the series or other energy topics, or if you have questions about the series, please contact me.

Sincerely,

County Extension Agent

The Texas A&M University System, U.S. Department of Agriculture, and the County Commissioners' Courts of Texas Cooperating

TEXAS AGRICULTURAL EXTENSION SERVICE L-1629

The Texas A&M University System

Save Home Energy

ENERGY USE OF APPLIANCES

The first step in saving home energy is to learn how much energy is consumed by appliances in your home. First, check appliance labels and instruction manuals to determine the wattage, Energy Efficiency Ratio (EER) or Btu* rating of appliances. The cost of operating an appliance is determined by four factors:

- the wattage, EER or Btu rating of the appliance
- the number of hours the appliance is operated
- the cost of electricity or gas used, including any fuel charge adjustments
- how the appliance is used

Computing the cost of operating appliances may help you: 1) to become aware of how the family uses energy; 2) to cooperate as a family in an energy conservation program; and 3) to develop ways to use the information in balancing the scales between higher utility costs and lowering energy consumption.

Although energy costs vary according to the energy efficiency of the appliance model and appliance-use patterns, the chart below estimates average costs. Some appliances have thermostatic controls to cycle energy on and off. Data given are for actual "on" time. The cost of energy will vary according to local rates for gas and electricity, so you may want to compute the cost of operating some of your appliances based on your local utility rates. Refer to your utility receipts to compute the average cost per kilowatt hour of electricity and the average cost per therm or cubic foot of gas.

*EER (Energy Efficiency Ratio) figures are derived by dividing appliance output capacity by the input energy requirements. The higher the EER figure, the more efficient the equipment.

Btu (British Thermal Unit) is a measure of heat energy. One Btu is the quantity of heat required to raise the temperature of 1 pound of water 1 degree Fahrenheit.

ELECTRICITY USAGE CHART*

The following list of appliances shows in the first column, the average wattage of such an appliance; in the second column, the average number of hours the appliance is used in one year; and in the third column, the average number of kilowatt hours each appliance will consume in one year.

Appliance	Ave. Wattage	Ave. Hours Per Year	Kwh Per Year
Air cleaner	50	4,320	210
Air conditioner (window)	1,566	750	1,175
Bed covering	177		147
Blanket	177	831	147
Blender	386	38.9	15
Broiler	1,436	69.7	100
Carving knife	92		8
Clock	2	8,500	17
Clothes Dryer	4,856	204	993
Coffeemaker	894	119	106
Deep fryer	1,448	57.3	83
Dehumidifier	257	1,467	377
Egg cooker	516		14
Fan, attic	370	786	291
Fan, circulating	88	489	43
Fan, rollaway	171	807	138
Fan, window	200	850	170
Floor polisher	305	49.2	15
Freezer, 15 cu. ft.	341	3,504	1,195
Freezer, frostless, 15 cu. ft.	440	4,002	1,761
Frying pan	1,196	157	188
Hair dryer	381	36.7	14
Heat lamp (Infrared)	250		13
Heater, portable	1,322	133	176
Heating pad	65	154	10
Hot plate	1,257	71.6	90
Humidifier	177	921	163
Iron, hand	1,008	143	144
Mixer	127	102	13
Oven, microwave	1,500	200	300
Oven, self clean	4,800	239	1,146
Radio	71	1,211	86
Radio/phonograph	109	1,000	109
Range	8,200	128	1,175
Refrig. 12 cu. ft.	241	3,021	728
Refrig./frostless, 12 cu. ft.	321	3,791	1,217
Refrig./frostless, 14 cu. ft.	326	3,448	1,137
Refrig./freezer 14 cu. ft.	615	2,947	1,829
Roaster	1,333	154	205
Sandwich Grill	1,161		33
Sewing Machine	75	147	11
Shaver	14	129	1.8
Sun lamp	279	57.3	16
Toaster	1,146	34	39
Toothbrush	7	7.14	0.5
TV, B&W (tube)	160	1,500	240
(solid state)	55	1,500	83
TV, Color (tube)	400	1,500	600
(solid state)	200	1,500	300
Vacuum cleaner	630	73	46
Vibrator	40	50	2
Waffle iron	1,116	19.7	22
Wash. mach. auto.*	521	198	103
Wash. mach. non auto.*	286	266	76
Waste disposer	446	67.4	30
Water heater	4,474	1,075	4,811

*Does not include water heating

*Electric Energy Association, "Annual Energy Requirements of Electric Household Appliances," New York, NY, 1973 (pamphlet).

- A *watt* is a measure of electric power, the rate at which electricity works. A 100-watt light bulb uses 100 watts of electricity when lighted. Appliances and light bulbs are labeled with the wattage they use.
- A *kilowatt* is 1000 watts.

READING UTILITY METERS

You can keep tabs on household energy use and also doublecheck the utility company's bills by learning to read your gas and electric meters.

Check Your Electric Meter

Your electric meter may be one of two types: a digital readout (Figure 1) or a dial readout (Figure 2).

There is less margin for error with the digital than with the dial type; however, since many meters are the dial type, you may need to learn how to read one to check on readings given on your utility bill.

If you have a digital meter like this one, just write down the numbers.

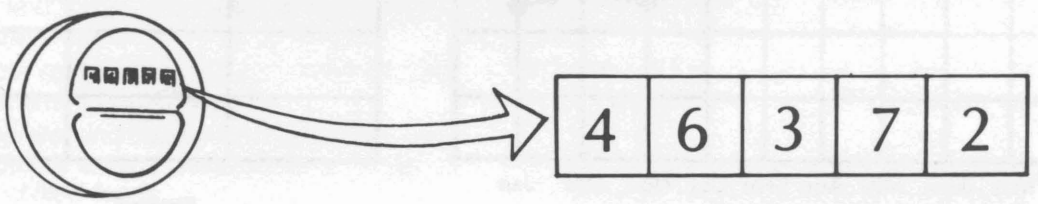

Figure 1

Prepared by Extension family resource management specialist, The Texas A&M University System

If your meter has dials, read the right one first; it measures a total of 10 kwh. Each time the pointer moves from one number to another on the first dial, you have used 1 kwh.

Be sure to check for a meter multiplier; normally 10 or 100 will be designated on the name plate. Residence meters normally have a multiplier.

In the meter shown in Figure 2, 4 kwh are measured on the first dial. The second dial on this meter shows that between 80 and 90 kwh have been used. (Note that some of the dials run clockwise, while others run counterclockwise.)

When you check the third dial you will see that the pointer is barely a hairbreadth away from 5. Do you read this as 5 or 4? First you must check the dial on the immediate right. Its pointer is now between 8 and 9, showing that if hasn't quite completed its present circling of the dial. Thus, you read the 1,000-kwh dial as 4. You'll read it as 5 after the pointer on the 100-kwh dial reaches 0.

On the fourth dial, of course, you read 9. Thus you have a complete meter reading of 9484.

Some meters may have five dials. Read the fifth dial, which indicates 100,000 kwh, as you did the fourth.

To find out how much electricity you have used since the last reading, subtract the old reading from the new reading.

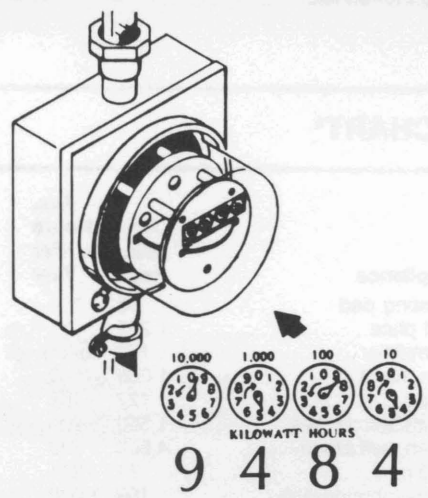

Figure 2

Check Your Gas Meter

There are five dials on the gas meter face. The smallest dial is a test dial . . . it's not included in the actual reading. The remaining four dials are divided into 10 segments, measuring the cubic feet of gas used. (A cubic foot is a unit for measuring the volume of natural gas, normally abbreviated as CCF.)

To read, start with the dial at the left and read the number the hand just passed.

Figure 3

Applying Your Meter-Reading Skills

Reading your meter develops an awareness of the amount of energy you are using in your home. Keep a weekly record of your utility usage. Try to read the meters at the same time each week. Use the form below for keeping track of your energy use.

WEEK OF	ELECTRIC METER READING	GAS METER READING

You may want to keep a record of the amount of electricity and gas you use each month. Compare this month's usage to previous months or to the corresponding months of the previous years. This information may be recorded on a graph as shown in Figure 4 for quick comparison.

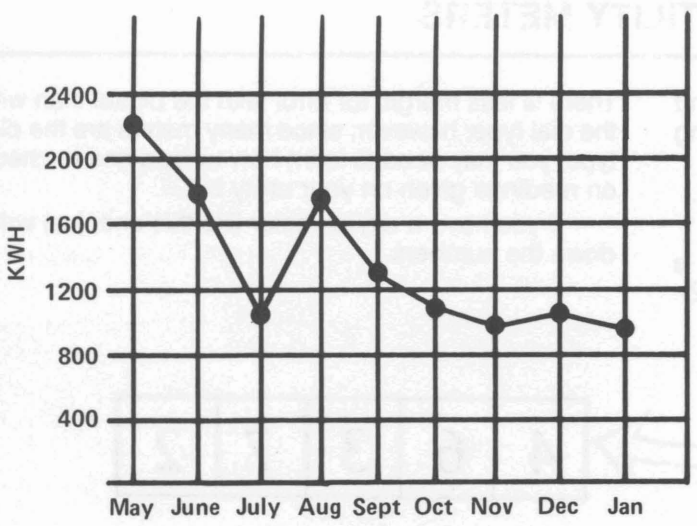

Figure 4

ELECTRICITY

MONTH	19___ YEAR	19___ YEAR
	C/kwh	C/kwh

Figure 5

GAS

MONTH	19___ YEAR	19___ YEAR
	ccf/$	ccf/$

Figure 6

APPLIANCE ENERGY CONSERVATION HINTS

Oven Cooking

Preheat the oven only for baking leavened products. It's unnecessary for other baking and uses 9 to 28 percent more energy than needed.

If you have both, *use the small eye-level oven* rather than the larger lower oven; depending on the temperature and length of cooking, you will use 25 to 50 percent less energy.

Microwave ovens are most efficient for reheating or for cooking small quantities. For these uses they take 30 to 70 percent less energy than regular ovens.

Continuous-cleaning ovens use from 1 to 22 percent more energy than *self-cleaning ovens* (those which have a separate cleaning cycle) depending upon temperatures and length of cooking times. Self-cleaning ovens are better insulated.

Convection gas ovens (forced-air) use about the same amount of energy as standard ovens when the energy of the electric ignition system is considered.

Electric convection ovens require lower temperatures and less cooking time.

Pilotless gas ranges using electric igniters will consume about 40 percent less energy than the average conventional gas ranges.

When a hand is between numbers, always use the smaller number.

The reading for the meter pictured in Figure 3 is 3457. So, your reading is 3457 HUNDRED CUBIC FEET or CCF.

To find out how much natural gas you have used since the last time you read your meter, subtract the old reading from the new reading.

Top-of-the-Range Cooking

A complete *meal cooked on the stove surface is the most economical,* using about half the energy needed for a complete broiler meal cooked in a gas stove. However, if it is a choice between gas broiler and gas oven, the complete oven meal uses 10 percent less energy than one prepared in the broiler.

Smooth-top electric surface units use about the same amount of energy as standard units, though models vary.

Thermostatically controlled surface units or burners use 2 to 22 percent less energy than standard units or burners.

Small Appliances

Using a pressure cooker saves time and energy. Besides cooking faster, it will use 26 to 42 percent less energy than a saucepan on top of the range for foods requiring steaming, braising or stewing.

Crockery cookers ("slow cookers") use more energy than other types of surface cooking but less than an oven. Using a higher temperature for a shorter cooking time requires 12 to 22 percent less energy than a lower setting for a longer cooking period.

Your *portable appliances are energy-savers* in most instances. Portable ovens, frypans and broilers will use from 9 to 44 percent less energy than large ovens or broilers when baking or broiling in small quantities.

Outdoor grills, either gas or electric, use from 100 to 300 percent more energy than other methods of cooking.

Air dry your hair whenever possible. When it is necessary to use an electric dryer, towel dry hair as much as possible.

Keep the *vacuum cleaner efficient by emptying or replacing the bag as* instructed by the manufacturer. Clean attachments after each use.

Refrigerators and Freezers

Vacuum the motor housing and the condenser coils of a refrigerator 3 or 4 times a year. Dust, dirt and animal hair will trap heat and act as an insulator on the condenser coils.

Defrost before build-up reaches ¼ inch. Ice on the coils acts as an insulator, cuts down the efficiency of the evaporator and forces the motor to run a higher percentage of the time.

Replace your refrigerator with an energy-efficient model when it is time to replace yours.

Keep *refrigerator and freezer full.* A partially empty appliance uses more energy because air is harder to keep cold than chilled foods.

Washing Dishes

Avoid partial dishwasher loads. Fill according to manufacturer's instructions. Turn off the unit and open the door at the end of the rinse cycle. The cost of electricity used to dry dishes will determine the savings. (.9 kw × 4.5¢ × ½ hr. = 2¢ per load)

When *hand washing dishes, avoid running hot water continually* for rinsing.

Heating Water

Set *water heater thermostat at 140 degrees Fahrenheit* if you have a dishwasher; otherwise, set at 120 degrees Fahrenheit. Savings will depend on the amount of temperature reduction (120 degrees could be damaging to a gas water heater by allowing fluegases to condense and rust the system).

The amount of water used for a tub bath vs. a shower depends upon the *flow rate,* the *length of time* the shower is running and *how full* the tub is filled. A typical bathtub filled to overflow holds 25 gallons of water. A conventional shower running at full force may use 7 to 9 more gallons of water a minute, but a showerhead designed for low flow rate may use as little as 3 gallons per minute. A short shower at a low flow rate will use less water than a typical tub bath.

Fix leaky faucets, especially hot water faucets. Leaks can waste 600 to 6,000 gallons of water a year and can be the cause of a high gas or electric bill.

Add a layer of non-combustible insulation around the outside of the water tank. For a typical gas-fire heater, omit insulation at the top of the tank and around vents or openings leading to the burner compartment. The investment can be paid back in a little over a year.

Washer Use

Use of hot water is the most significant energy factor in clothes washing.

$$30 \text{ gal.} \times \frac{1 \text{ kwh}}{5 \text{ gal.}} \times .025$$

=

15¢/load if 140° water
8¢/load if 120° water

Use cold water for rinsing, since rinse water temperature does not affect cleaning.

Select water level to match load size.

Use *hot water only for heavily soiled* clothes.

Dryer Use

Do not mix heavy fabrics with light fabrics.

Avoid overloading and overdrying.

Lightly loaded dryers seem to use less energy than heavily loaded due to better air flow.

Clean lint screen after each load; check it before starting dryer again.

Vacuum lint from motor housing *at least once a year* and follow the manufacturer's maintenance instructions listed in owner's manual.

Locate dryer in heated area if possible.

Dry clothes outdoors on a clothes line whenever possible.

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